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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.	
10/541,704	07/08/2005	Norio Ohtake	F-8744	9784	
	7590 07/07/201 HAMBURG LLP	1	EXAMINER		
122 EAST 42N	D STREET		RAPHAEL, COLLEEN M		
SUITE 4000 NEW YORK, N	NY 10168		ART UNIT	PAPER NUMBER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)	
	10/541,704	OHTAKE ET AL.	
Office Action Summary	Examiner	Art Unit	
	COLLEEN M. RAPHAEL	1724	
The MAILING DATE of this communication a Period for Reply	appears on the cover sheet wit	h the correspondence address	
A SHORTENED STATUTORY PERIOD FOR REF WHICHEVER IS LONGER, FROM THE MAILING - Extensions of time may be available under the provisions of 37 CFR after SIX (6) MONTHS from the mailing date of this communication. - If NO period for reply is specified above, the maximum statutory perion. - Failure to reply within the set or extended period for reply will, by stat Any reply received by the Office later than three months after the may earned patent term adjustment. See 37 CFR 1.704(b).	DATE OF THIS COMMUNIC 1.136(a). In no event, however, may a re od will apply and will expire SIX (6) MONT oute, cause the application to become ABA	ATION. ply be timely filed HS from the mailing date of this communication and the mailing date of the mailing dat	
Status			
1) ■ Responsive to communication(s) filed on 12 2a) ■ This action is FINAL . 2b) ■ The 3) ■ Since this application is in condition for allow closed in accordance with the practice under the second s	nis action is non-final. vance except for formal matte	• •	s
Disposition of Claims			
4) ☑ Claim(s) 10-21 is/are pending in the applicate 4a) Of the above claim(s) is/are withd 5) ☐ Claim(s) is/are allowed. 6) ☑ Claim(s) 10-21 is/are rejected. 7) ☐ Claim(s) is/are objected to. 8) ☐ Claim(s) are subject to restriction and	rawn from consideration.		
Application Papers			
9) ☐ The specification is objected to by the Exami 10) ☑ The drawing(s) filed on 12 April 2011 is/are: Applicant may not request that any objection to the Replacement drawing sheet(s) including the correction. 11) ☐ The oath or declaration is objected to by the	a) accepted or b) abjective drawing(s) be held in abeyand ection is required if the drawing(s	ee. See 37 CFR 1.85(a). s) is objected to. See 37 CFR 1.121(d).
Priority under 35 U.S.C. § 119			
12) Acknowledgment is made of a claim for foreign a) All b) Some * c) None of: 1. Certified copies of the priority docume 2. Certified copies of the priority docume 3. Copies of the certified copies of the priority docume application from the International Bure * See the attached detailed Office action for a li	ents have been received. ents have been received in Apriority documents have been reau (PCT Rule 17.2(a)).	oplication No received in this National Stage	
Attachment(s) 1) Notice of References Cited (PTO-892) 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)		ummary (PTO-413) /Mail Date	
3) Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date	_	formal Patent Application	

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Art Unit: 1724

DETAILED ACTION

Status of Claims

1. Claims 10-21 are current in the application. Claims 10-21 are currently under examination.

Claims 1-9 were cancelled by Applicant.

Drawings

2. The drawings were received on April 12, 2011. Figs. 1 and 2 are accepted. Fig. 3 is not accepted. Fig. 3 still does not clearly show how the secondary side piping and the primary side piping are connected to part 3. It is also unclear to the Examiner what the dotted lines (that are superimposed over Fig. 3) are meant to separate and delineate. The Examiner is uncertain whether the dotted lines are meant to delineate the primary side piping from the secondary side piping, or whether there is an entirely different purpose to the dotted lines.

Specification

3. The substitute specification filed April 12, 2011 has not been entered because it does not conform to 37 CFR 1.125(b) and (c) because: it is unclear from Fig. 3 and the text of the specification where the secondary side piping 39 is located and how it is connected to the cell 3, and where the primary side piping 37 is located and how it is connected to the cell 3 (p. 13, lines 20-21 and p. 14, lines 1-3). In Fig. 3, part 39 is connected to V1, not part V2, and part 37 is located between part AV3 and part AV4, not between parts 11 and AV1. It is unclear to the Examiner which part (V1 or V2) is the introducing valve at the glass cell 3.

Claim Rejections - 35 USC § 112

- 4. The following is a quotation of the first paragraph of 35 U.S.C. 112:
 - The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
- 5. Claims 10-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s),

at the time the application was filed, had possession of the claimed invention. It is unclear to the Examiner from Fig. 3 and the text of the specification where the secondary side piping 39 is located and how it is connected to the cell 3, and where the primary side piping 37 is located and how it is connected to the cell 3 (p. 13, lines 20-21 and p. 14, lines 1-3).

Claim Rejections - 35 USC § 103

- 6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
- 7. Claims 10-18 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryan et al (US 5,934,103) in view of Shino et al (US 5,039,500).
- 8. Regarding claim 10, Ryan teaches a method of producing nuclear spin polarized xenon gas comprising: heating a glass cell filled with solid rubidium and xenon in the pressure reducing state of being absent in oxygen to produce therein gaseous xenon and a mixture of gas and liquid phases of rubidium (col. 3, lines 56-64), irradiating with a laser beam the gaseous xenon and the mixed-phase rubidium that is in the glass cell and is produced from the solid xenon and solid rubidium, and applying a magnetic field to the irradiated gaseous xenon and mixed-phase rubidium in the glass cell to achieve the nuclear spin polarized xenon gas. (col. 4, lines 14-29). It is inherent that the glass cell of Ryan is oxygen-free, as the rubidium (an alkali metal) is in elemental form. See MPEP § 2112(II).
- 9. Ryan does not explicitly teach that the xenon is solidified in the glass cell.
- 10. Shino et al teaches introducing xenon gas into a system and cooling it in order to solidify it. (col. 2, lines 3-10). Shino et al teaches that this allows separation of xenon from impurities such as krypton, and production of high-purity xenon. (col. 2, lines 35-43).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Ryan by solidifying (condensing) the xenon onto the solid rubidium before heating the xenon and rubidium to produce a mixture of gaseous rubidium and xenon, because this would allow separation of xenon from impurities such as krypton, and production of high-purity xenon for further processing by the method of Ryan. (see Shino et al, col. 2, lines 35-43).

Regarding claim 11, Ryan teaches the method of claim 10, further comprising: removing nuclear spin polarized xenon gas from the glass cell; and during said removing, introducing xenon gas into the glass cell in a manner that maintains fixed pressure within the glass cell. (col. 3, lines 65-67 and col. 4, lines 1-13)

Regarding claim 20, Ryan teaches the method of claim 11, further comprising: after said removing and introducing, isolating the glass cell to prevent entry or exit of contents. (col. 6, lines 3-15)

Note that mere repetition of a step (e.g. repeating the steps of removing and introducing) until a threshold is met is obvious. See *Perfect Web Technologies v. InfoUSA*, 587 F.3d 1324, 1329 (Fed. Cir. 2009)

Ryan does not explicitly teach cooling the isolated glass cell sufficiently to solidify xenon gas content.

11. Shino et al teaches introducing xenon gas into a system and cooling it in order to solidify it. (col. 2, lines 3-10). Shino et al teaches that this allows separation of xenon from impurities such as krypton, and production of high-purity xenon. (col. 2, lines 35-43).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Ryan by solidifying (condensing) the xenon onto the solid rubidium before heating the xenon and rubidium to produce a mixture of gaseous rubidium and xenon, because this would allow separation of xenon from impurities such as krypton, and production of high-purity xenon for further processing by the method of Ryan. (see Shino et al, col. 2, lines 35-43).

Regarding claim 12, Ryan teaches the method of claim 11, wherein said xenon gas is introduced from a xenon gas supply device into the glass cell along primary side piping, located between the xenon gas supply device and a first air operate valve, and second side piping, located between the first air operate valve and the glass cell; and further comprising: replacing the xenon gas supply device while the glass cell is coupled to the secondary side piping and to outlet piping; vacuuming the primary side piping (col. 6, lines 3-14); and pressurizing the primary side piping with nitrogen gas. (Fig. 3, col. 5, lines 42-65) Note that mere repetition of a step until a threshold is met (e.g. the vacuuming and pressurizing are repeated automatically at least three times after the replacing) is obvious. See *Perfect Web Technologies v. InfoUSA*, 587 F.3d 1324, 1329 (Fed. Cir. 2009)

Regarding claim 13, Ryan teaches a method for producing nuclear spin polarized xenon gas wherein said xenon gas is introduced from a xenon gas supply device into the glass cell along primary side piping, located between the xenon gas supply device and a first air operate valve, and second side piping, located between the first air operate valve and the glass cell; wherein nuclear spin polarized xenon gas is removed from the glass cell through outlet piping, and wherein branch piping connects between a valve at the outlet piping and a second air operate valve coupled to the primary side piping, and further comprising: replacing the glass cell with another glass cell filled with solid rubidium and solid xenon; opening the first and second air operate valves and the valve at the outlet piping; vacuuming the primary side piping, secondary side piping, and branch piping gas; and closing the first and second air operate valves and the valve at the outlet piping, and branch piping with nitrogen gas; and closing the first and second air operate valves and the valve at the outlet piping (col. 6, lines 15-34). Note that mere repetition of a step (e.g. the opening, vacuuming, pressurizing, and closing are repeated automatically at least three times after the replacing) until a threshold is met is obvious. See *Perfect Web Technologies v. InfoUSA*, 587 F.3d 1324, 1329 (Fed. Cir. 2009)

Regarding claim 14, Ryan teaches filled with solid rubidium and solid xenon in a vacuum from glass encased rubidium located in a chamber, the chamber coupled to the glass cell by piping, the method comprising; exhausting the piping with a vacuum generator; breaking the glass that encases the rubidium; heating the rubidium, the piping and the glass cell causing rubidium to enter into a gaseous state, wherein the gaseous rubidium enters the glass cell; cooling the glass cell causing rubidium to precipitate as a solid within the glass cell; filling the glass cell having solid rubidium with xenon gas; and isolating the filled glass cell. (col. 6, lines 14-34)

Ryan does not teach cooling the isolated glass cell causing xenon within the glass cell to solidify and the glass cell to assume a pressure reducing state.

12. Shino et al teaches introducing xenon gas into a system and cooling it in order to solidify it. (col. 2, lines 3-10). Shino et al teaches that this allows separation of xenon from impurities such as krypton, and production of high-purity xenon. (col. 2, lines 35-43).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Ryan by solidifying (condensing) the xenon onto the solid rubidium, because this would allow separation of xenon from impurities such as krypton, and production of high-purity xenon for further processing by the method of Ryan. (see Shino et al, col. 2, lines 35-43).

Regarding claim 15, Ryan teaches an apparatus for producing nuclear spin polarized xenon gas, comprising: means for heating a glass cell filled with solid rubidium and solid xenon in the pressure reducing state of being absent in oxygen to produce therein gaseous xenon and a mixture of gas and liquid phases of rubidium; (col. 3, lines 56-64) and a laser projecting a beam into the glass cell for irradiating the gaseous xenon and the mixed-phase rubidium; and means for applying a magnetic field to the irradiated gaseous xenon and mixed-phase rubidium to achieve the nuclear spin polarized xenon gas. (col. 4, lines 14-29). It is inherent that the glass cell is oxygen-free, as the rubidium (an alkali metal) is in elemental form. See MPEP § 2112(II).

Ryan does not explicitly teach that the xenon is solidified in the glass cell.

13. Shino et al teaches introducing xenon gas into a system and cooling it in order to solidify it. (col. 2, lines 3-10). Shino et al teaches that this allows separation of xenon from impurities such as krypton, and production of high-purity xenon. (col. 2, lines 35-43).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the apparatus of Ryan by solidifying (condensing) the xenon onto the solid rubidium before heating the xenon and rubidium to produce a mixture of gaseous rubidium and xenon, because this would allow separation of xenon from impurities such as krypton, and production of high-purity xenon for further processing in the apparatus of Ryan. (see Shino et al, col. 2, lines 35-43).

Regarding claim 16, Ryan teaches the apparatus of claim 15, further comprising: means for introducing xenon gas while taking out the produced nuclear spin polarized xenon gas; and pressure regulating means for maintaining a fixed pressure within the glass cell while xenon gas is being introduced and nuclear spin polarized xenon gas is being taken out. (col. 3, lines 65-67 and col. 4, lines 1-13)

Regarding claim 21, Ryan teaches the apparatus of claim 16, further comprising: means for isolating the glass cell to prevent entry or exit of contents. (Fig. 3, parts 78, 80, 82, 84, and 66-74, col. 6, lines 3-15)

Ryan does not explicitly teach a means for cooling the isolated glass cell sufficiently to solidify xenon gas content.

Shino et al teaches a means for cooling xenon gas in a system sufficiently to solidify it. (col. 2, lines 3-10). Shino et al teaches that this allows separation of xenon from impurities such as krypton, and production of high-purity xenon. (col. 2, lines 35-43).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the apparatus of Ryan by adding a means for cooling xenon gas sufficiently to solidify it as taught by Shino et al, because this would allow separation of xenon from impurities such as krypton, and production of high-purity xenon. (see Shino et al, col. 2, lines 35-43).

Regarding claim 17, Ryan teaches the apparatus of claim 15, further comprising: a xenon gas supply device; a first air operate valve; primary side piping coupling the xenon gas supply device to the first air operate valve; secondary side piping coupling the glass cell to the first air operate valve (Fig. 3, parts 44b, 66, 98, col. 5, lines 42-65); pressure regulating means (Fig. 3, parts 44a, 44b, 60b, 62, col. 5, lines 42-65); a second air operate valve coupled to the primary side piping (Fig. 3, parts 82, 70, 78, col. 5, lines 42-65 and col. 6 lines 1-34); outlet piping coupling the glass cell to an outlet; a third valve coupled to the outlet piping; and branch piping coupled to the second air operate valve, the branch piping having a first branch coupled to the third valve and having a second branch coupled to a vacuum generator (Fig. 3, part 86, col. 6 lines 1-14).

Regarding claim 18, Ryan teaches an apparatus of a glass cell having solid rubidium and xenon in a vacuum therein, comprising: a chamber housing glass encased rubidium; piping coupling the chamber and a glass cell (Fig. 3 parts 94, 96, 98, col. 6 lines 14-34); a vacuum generator coupled to the piping for exhausting the piping (Fig. 3, part 86, col. 6 lines 1-14); means for breaking the glass that encases the rubidium (Fig. 3, part 94a, col. 6 lines 14-34); means for heating the rubidium, the piping and the glass cell causing rubidium to enter into a gaseous state, wherein the gaseous rubidium enters the